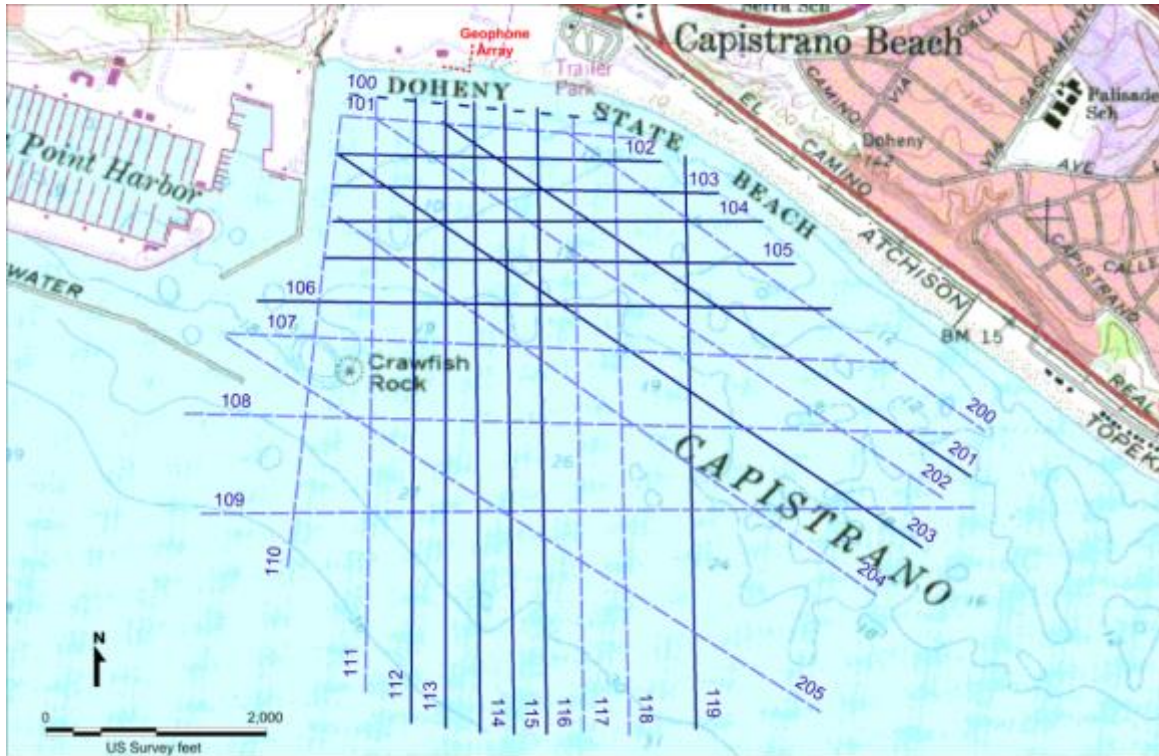


GEOPHYSICAL SURVEY OFFSHORE OF DANA POINT, CALIFORNIA

Field Operations Report



Submitted to:

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GEOPHYSICAL SURVEY OFFSHORE OF DANA POINT, CALIFORNIA

Field Operations Report

1.0 INTRODUCTION

EcoSystems Management Associates, Inc. (ECO-M), a subsidiary of Coastal Environments (CE) conducted an offshore geophysical survey offshore of Dana Point, California on 18 October 2016, to determine the boundaries of the offshore San Juan paleo-river channel seaward of Doheny State Beach. Operations were conducted from the survey vessel 'Early Bird II', a 2010 Armstrong marine aluminum catamaran.

The survey area occurred offshore and adjacent to San Juan Creek in Dana Point, California. The survey was conducted from just beyond the surf zone to about 9000 feet (ft) (1.5 miles) offshore and approximately 8300 ft (1.4 miles) alongshore and imaged the sub-bottom geology to depths exceeding 200 feet. The survey completed 14 transect lines (Figure 1-1).

Equipment included the following:

1. 300 Joule Boomer system, including the Boomer Control Box and towed sonographic delivery system;
2. Geometric CNT-2 controller data-acquisition system with nominal 240-channel recording capability;
3. 24-channel, high-resolution GeoEel™ digital streamer hydrophone array;
4. Trimble GPS antenna and differential GPS receiver.

The data were acquired with a 300-joule "boomer" acoustic source towed at a depth of 0.3-m (1-ft) below the sea surface. A 24-channel GeoEel™ high-resolution digital streamer with a group interval of 1.56-m (5.12-ft) recorded the reflected acoustic wave energy at a sampling interval of 0.25-ms for a record length of 1000 samples equal to 0.25 sec (250-ms). Common Depth Point (CDP) processing will be applied to the data to provide digital seismic images for interpretation on a workstation using the Geographix™ software.

1.1 PERMITTING: CA STATE LANDS COMMISSION

Prior to the geophysical survey work, ECO-M acquired the necessary permit from the California State Lands Commission (Permit # PRC 8536.9). As per permit requirements, a Marine Wildlife Contingency Plan was prepared and a marine mammal observer was present during the surveys to assure that marine mammals were not harmed by the low energy sonic pulses generated by the geophysical survey equipment. Mammal observations that were carried out during the surveys determined when survey activities should be altered or stopped to avoid interaction with marine mammals. A copy of the Marine Mammal Observer Report during the survey (18 October 2016) is in Appendix A. Additionally, all parties identified in Exhibit C of the permit were sent notification of the geophysical survey activity.

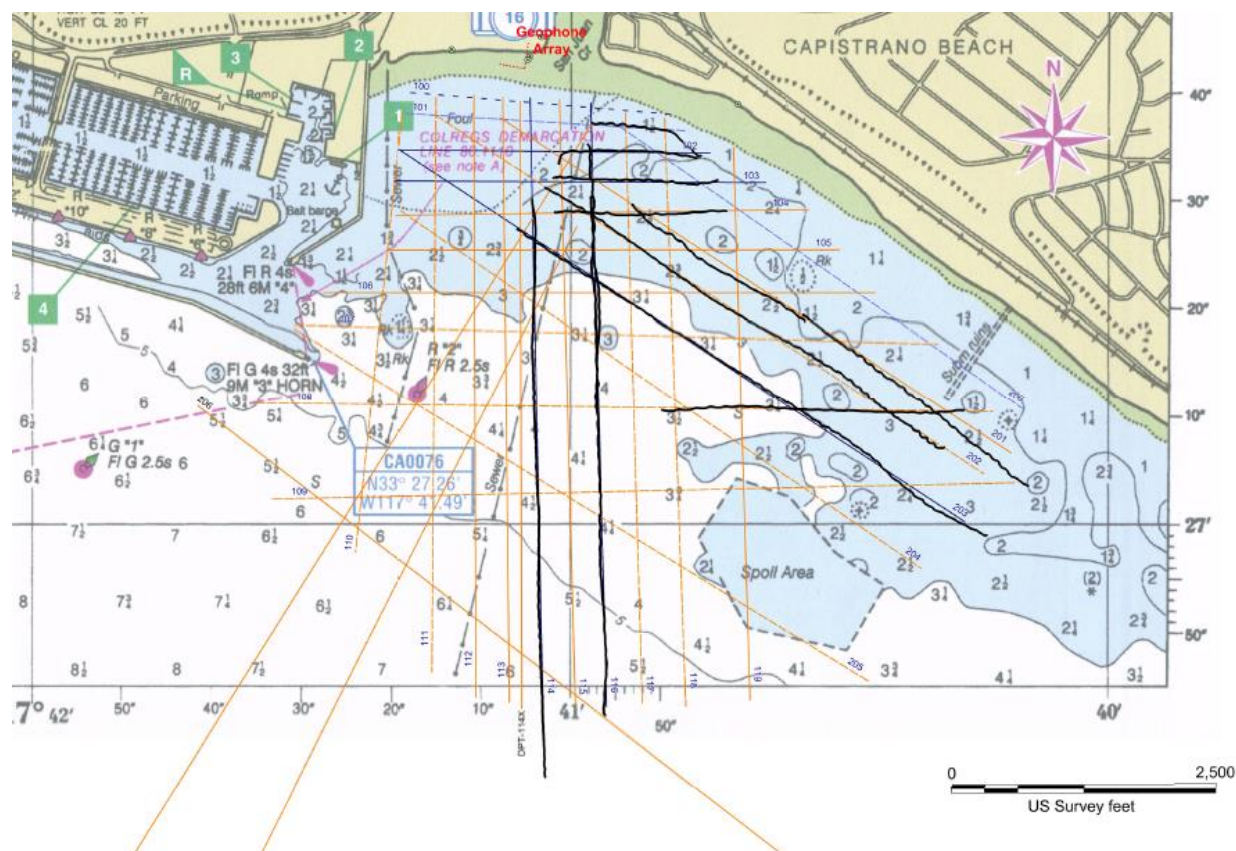


Figure 1-1. Map showing location of the geophysical survey offshore of Dana Point, Orange County, CA. A nautical chart serves as a background map, and shows the full area of coverage. The solid lines indicate the 14 survey lines completed. The orange lines indicate lines conducted during the previous survey on June 14, 2016.

2.0 SURVEY METHODS AND INSTRUMENTATION

2.1 GEOPHYSICAL SURVEY DATE

The survey was conducted on October 18th 2016 to determine the boundaries of the offshore San Juan paleo-river channel seaward of Doheny State Beach.

2.2 SURVEY VESSEL

Operations were conducted from the survey vessel ‘Early Bird II’, a 2010 Armstrong marine aluminum catamaran. The vessel was equipped with the following primary equipment for execution of the survey:

1. 300 Joule Boomer system, including the Boomer Control Box and towed sonographic delivery system;
2. Geometric CNT-2 controller data-acquisition system with nominal 240-channel recording capability;
3. 24-channel, high-resolution GeoEel™ digital streamer hydrophone array; Trimble GPS antenna and differential GPS receiver.

2.3 GEOPHYSICAL SURVEY

The survey conducted on the afternoon of October 18, 2016, covered the area from beyond the surf zone to about 9000 feet offshore and imaged the sub-bottom geology to depths exceeding 200 feet. We recorded the seismic reflection data to at least 200 milliseconds two-way travel time. Because seismic reflection profiling measures the subsurface geological reflections in time (two-way travel time – down and back), it is necessary to have information on the sub-bottom seismic velocity. Multichannel seismic profiling obtains that information from the differential travel times to the offset hydrophone groups in the streamer. The seismic velocity structure is also useful for interpreting lithology. Geological ground truth from wells or boreholes is still required, however, to confirm interpretation of subsurface geology from seismic images.

Some profiles consist of multiple pieces (2) because of interruptions requiring course changes due to heavy swell. The data were acquired with a 300-joule “boomer” acoustic source towed at a depth of 0.3-m (1-ft) below the sea surface. A 24-channel GeoEel™ high-resolution digital streamer with a group interval of 1.56-m (5.12-ft) recorded the reflected acoustic wave energy at a sampling interval of 0.25-ms for a record length of 1000 samples equal to 0.25 sec (250-ms). Common Depth Point (CDP) processing will be applied to the data to provide digital seismic images for interpretation on a workstation using the Geographix™ software. Both stacked and migrated seismic profiles will be produced for interpretation.

Data quality was established in the field during acquisition by monitoring data being recorded by the digital data acquisition system and by preliminary seismic data processing aboard the boat (Profiles DNP-101 and DNP-103). The software used for digital recording of the seismic reflection trace data allow display of shot records and some quantitative measures of acoustic signal and noise levels. The Vista™ seismic data processing software was also used on a laptop computer in the field to examine shot records and perform preliminary data processing, including brute stacking (DNP-101), to insure that data are suitable for interpretation to the target depths and cover the area of interest. Single-channel monitor records from the data acquisition system (DNP-103) were also prepared to show data quality and allow preliminary geological interpretation so that any prominent subsurface features identified may be specifically targeted in subsequent tracklines, including extension of the line if necessary. Once underway, it is easy to extend a line for a few hundred feet at minimal cost in time and effort.

2.4 DATA ACQUISITION AND INSTRUMENTATION

2.4.1 GPS Positioning

A differential Global Positioning Satellite (GPS) navigation system was used to record the shot points at precisely one-second intervals during acquisition. The differential system used ties to the Coast Guard maintained permanent GPS base station in the area. Nominal GPS position accuracy is about 10 meters, and with differential technique, we achieved sub-meter position accuracy (< 3-ft). The shot point navigation (geographic coordinates) during acquisition was based upon the World Geodetic System of 1984 (WGS84) and were converted to the California State Plane Coordinate System, zone 6, North American Datum of 1983 (NAD83), in feet. Shot point positions were determined by adding corrections for the layback or acoustic source distance behind the GPS antenna on the boat

2.4.2 300 Joule Boomer system and 24-channel GeoEel™ Hydrophone streamer

The profiling system consisted of a 300-joule boomer acoustic source and a 24-channel GeoEel hydrophone streamer with group interval of 1.56-m (5-ft). The multichannel system is shown in Figure 2-1. The boomer source is capable of producing acoustic energy pulses with frequency bandwidth up to about 1,000-Hz, but considering spatial aliasing due to back-scattered acoustic energy in the water column, it normally provides useful bandwidth to about 500-Hz with a short streamer group interval. The final processed seismic profiles were filtered to a bandwidth of 72-640 Hz. At a typical compressional wave velocity in water-saturated sediments of about 1,520 m/s (5,000 ft/s), the sub-bottom resolution achieved is about 1.5-m (5-ft) for half wavelength events or about 0.6-m (2-ft) considering “tuning” effects.



Figure 2-1. High-resolution multichannel seismic equipment: Above left is the 300-Joule Boomer in Tow; Above Right is the 16-channel GeoEel digital mini-streamer (24-channel version proposed effort). Below is a view of the equipment deployed for a survey offshore Santa Cruz, California. The boomer sled is in the mid-foreground and the streamer tail buoy is the white object in the right center.

Table 2-1. Trackline GPS coordinates for the offshore Dana Point geophysical survey on 18 October 2016

#	Date	Line	Lat Start	Long Start	Lat End	Lat End
1	10/18/2016	DNP104	33.458002	117.68876	33.45815	117.675975
2	10/18/2016	DNP105	33.457099	117.689027	33.457105	117.675009
3	10/18/2016	DNP106	33.456002	117.690978	33.455997	117.673909
4	10/18/2016	DNP107	33.455174	117.691879	33.454671	117.671945
5	10/18/2016	DNP112	33.461108	117.686351	33.445531	117.686235
6	10/18/2016	DNP113	33.461057	117.685456	33.445415	117.6852
7	10/18/2016	DNP115	33.460649	117.681651	33.445372	117.681085
8	10/18/2016	DNP117	33.460504	117.680439	33.4453	117.67973
9	10/18/2016	DNP118	33.459756	117.678303	33.445468	117.677741
10	10/18/2016	DNP119	33.46053	117.685542	33.451855	117.669667
11	10/18/2016	DNP200	33.460602	117.687561	33.451321	117.670521
12	10/18/2016	DNP201	33.458121	117.68862	33.448864	117.672446
13	10/18/2016	DNP204	33.455074	117.691897	33.445944	117.674063
14	10/18/2016	DNP999	33.453084	117.694873	33.440887	117.675794

2.5 DATA PROCESSING

2.5.1 Data Processing

Data processing was based on the Common-Depth-Point (CDP) wavelet processing method using the commercial seismic data processing program Vista™ (vers. 10) for 2-D seismic reflection data. Processing steps included: trace editing to remove spikes, band-pass filtering to avoid aliasing, spiking deconvolution to shape the zero-phase wavelet, spherical divergence correction to account for wavefront spreading, trace scaling to account for source variability, normal-moveout (NMO) correction using a stacking velocity of 5,000 ft/s, stacking sorted CDP records, and FK migration at 4,800 ft/s to sharpen the image. Static corrections were applied to account for depth of acoustic source and streamer, and remove the tidal elevation. For shallow subsurface marine seismic data, brute stacks at a constant velocity of 5,000 ft/sec provided good seismic images. Velocity analysis at several locations along key profiles (lines 104 and 203) were performed to provide more seismic velocity structure needed for time-to-depth conversion. The results of the velocity analysis showed that a constant velocity of 5,000 ft/sec (1,520 m/s) was valid for stacking the data at the shallow depths of interest. Post-stack migration of the seismic data using the frequency-wave number method with a constant velocity of 4,800 ft/sec (1,463 m/s) provided a sharper image of subsurface structure by collapsing diffractions and moving dipping reflectors to more accurate positions. The processed seismic data products include both stacked and migrated SEG-Y format data files that were loaded into the workstation for interpretation. Printed copies of seismic profiles saved as pdf files were used for quality control during processing and for plots in the survey report.

3.0 RESULTS

The results of the seismic profiles for selected transects are shown in Figures 3-1 through 3-3. Daily field logs are found in Tables 3-1 and 3-2. Profile DNP-103 is a single-channel monitor record that shows the data quality achieved in the field without any data processing except for band-pass filtering. Profile DNP-101 is a “Brute” stack of the data using the CDP data processing method and shows excellent data quality to almost 200-ms two-way travel time (> 500 feet subsea). A strong reflective sequence exists at about 50-ms two-way travel time (about 125-150 feet subsea).

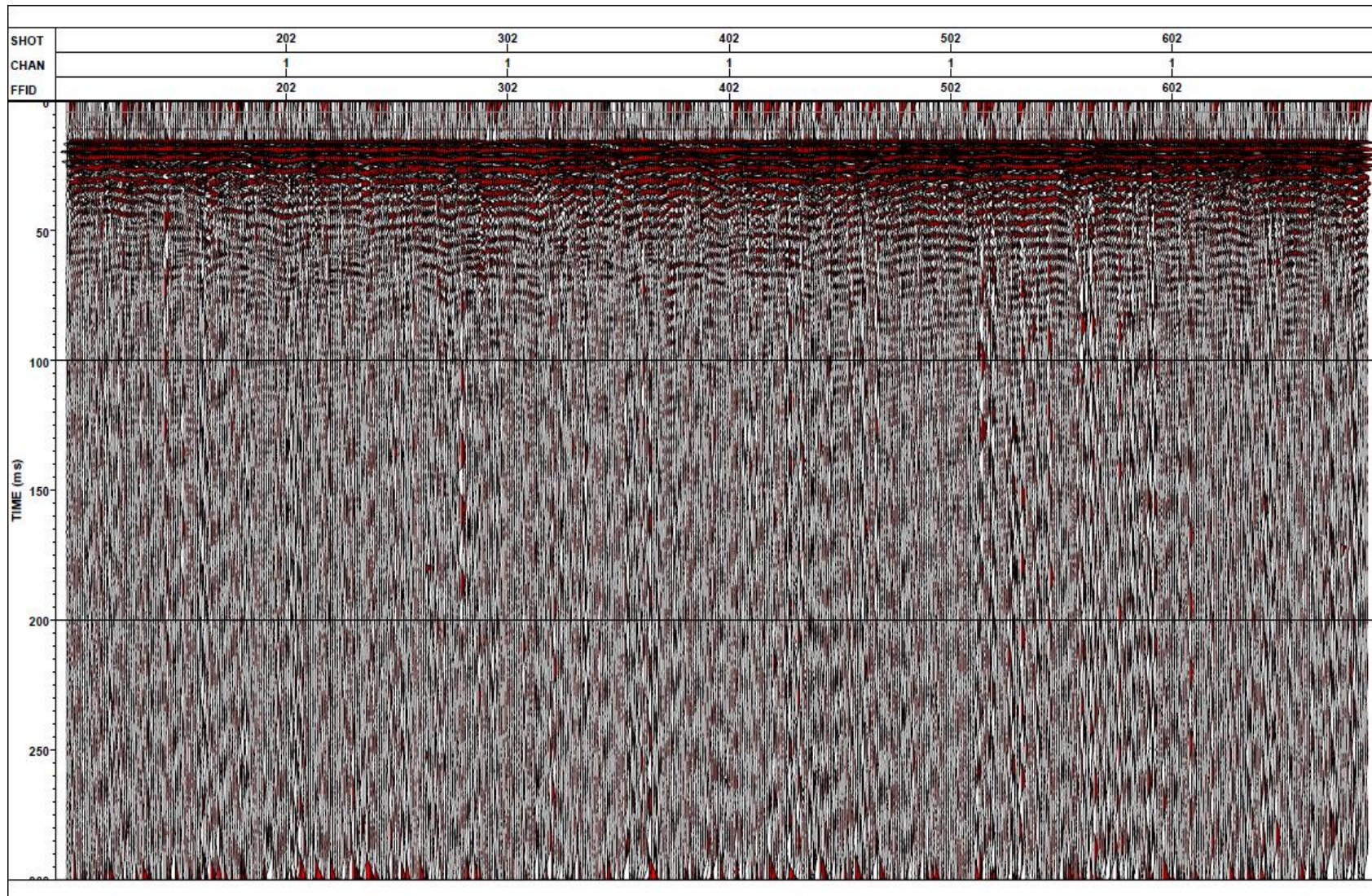


Figure 3-1. Single-channel Q/C plot of line DNP-103.

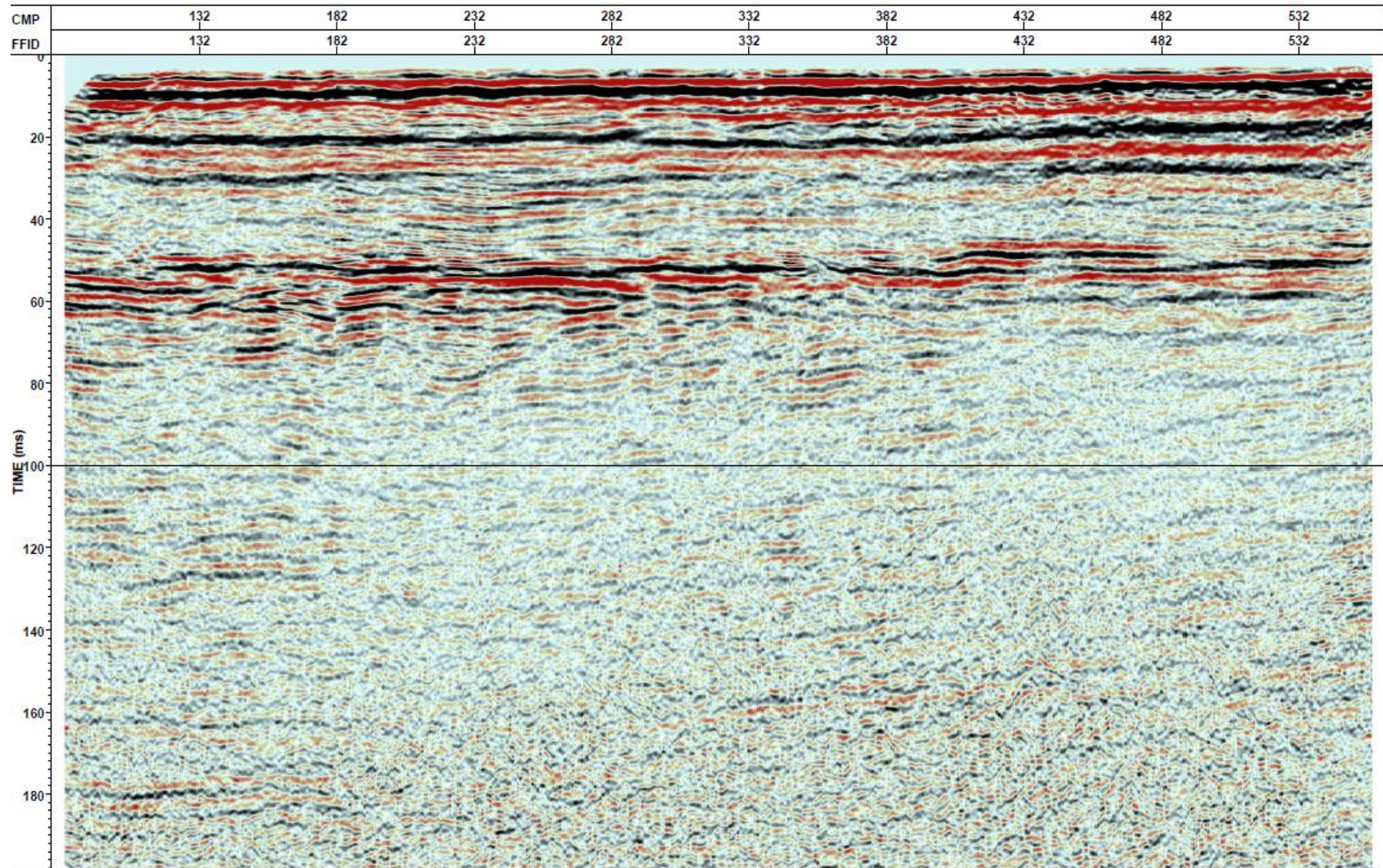


Figure 3-2. A fully stacked and migrated version of line DNP-101.

APPENDIX A
MARINE MAMMAL OBSERVER REPORT

**MARINE MAMMAL OBSERVATION REPORT
SAN LUIS RAY GEOPHYSICAL SURVEY
DANA POINT, CALIFORNIA**

Vessel: R/V Early Bird II

Captains: Ken Nielsen, Bob Lohrman

Scientific crew: Mark Legg, Doug Bowlus, James Peeler, Ryan Switzer, Brian Villalobos

Marine Mammal Observer: Chris Castillo

Dates of survey: Oct 18 2016

A geophysical survey offshore of Dana Point, California was conducted in order to determine the boundaries of the offshore San Juan paleo-river channel seaward of Doheny State Beach. The acoustic source consisted of a small 300-joule boomer similar to sources used by the U.S. Geological Survey. A 24-channel high-resolution digital streamer hydrophone array will be used to collect signals returning from the seafloor to improve the signal quality and attenuate the water bottom multiple, a 24-channel high-resolution digital streamer hydrophone array will be used to collect signals returning from the seafloor. The survey was conducted from just beyond the surf zone to about 9000 feet (ft) (1.5 miles) offshore and approximately 8300 ft (1.4 miles) alongshore.

The study required the use of sound producing instrumentation, requiring the presence of a marine mammal observer (MMO). The echo-sounder emits a low-frequency pulse of 200-800 Hz at 0.78-sec intervals, towed at a distance of 20-m from the vessel. The hydrophone streamer contained an array of 25 hydrophones, extending 40-m from the vessel. Two types of acquisition were performed, high resolution reflection profiles utilizing 24 channel streamer and a source rep-rate of 0.78 seconds. The energy source was operated at 300 joules so impact on marine was minimal. Lower resolution profiles were collected on shore-perpendicular transects at 1 sec source rep-rate. These acoustic sources were recorded on land by a Geometrics Geode 72 channel recorder. A pre-watch duration of 20 minutes and an exclusion zone of 100 m radius for non-shutdown species, and 500m for protected species from the acoustic source of were set as the parameters for operation of the echo-sounder.

Fourteen transect lines were surveyed along the coastline of Dana Point, including the area south of the mouth of San Juan Creek. Marine mammals most likely to be encountered in the near-shore area were California sea lions (*Zalophus californianus*), Harbor seals (*Phoca vitulina*), Bottlenose dolphin (*Tursiops truncatus*), Common dolphin (*Delphinus* spp.), and Gray whales (*Eschrichtius robustus*) and Humpback Whales (*Megaptera novaeangliae*). A harbor seal was visible during the pre-watch requiring us to delay the start of ramp up. No sightings of cetaceans occurred during the survey, as whale has just begun for the 2016 season, and the whales are still far north. Four harbor seals sightings occurred, but no signs of distress were observed and there was cause for a shut-down. One possible sighting of a Harbor Seal occurred during operation of the acoustic source, but the sighting was not confirmed.

The results of the Marine Mammal Observer report are described below. Daily field log reports are found in Table A-1.

Survey Date: 18 October 2016

Conditions: clear skies; 66° F; wind 5-10 knots from the NE; swell 0.5; Beaufort 1

Time	Observation/ Vessel Activity
08:00	Leave dock, prewatch started
08:30	Harbor seal fin and tail observed while in transit to deployment location 20 m off bow of vessel.
09:06	Pre-watch complete.
09:19	Ramp-up of acoustic source.
09:26	Harbor seal observed resting on red buoy at harbor entrance, Photo 1A
09:29	Ramp-up complete
09:36	Start of Line 204
09:41	End of Line 204
09:56	Start of Line 104
09:58	End of Line 104
10:07	Start of Line 106
10:11	End of Line 106
10:23	Start of Line 107
10:25	Paddle boarder crossing streamer
10:26	Fast boat crossing near streamer
10:30	End of Line 107
10:39	Start of Line 200
10:44	End of Line 200
10:55	Leave dock, prewatch started

Conditions: clear skies; 68° F; wind 0-5 knots from the sw; swell ~3' @ 13s; Beaufort 1

Time	Observation/ Vessel Activity
10:59	Start of Line 117
11:01	End of Line 117 due to error
11:10	Start of Line 119
11:13	Possible sea lion spotted 50 m away from starboard bow. Dove underwater.
11:23	End of Line 119
11:25	Start of Line 118
11:39	End of Line 118
11:41	Start of Line 117
11:55	End of Line 117
12:00	Start of Line 112
12:13	End of Line 112
12:14	Start of Line 201
12:28	End of Line 201
12:37	Start of Line 105
12:50	End of Line 105
12:55	Start of Line 999
13:00	End of Line 999
13:08	Start of Line 113
13:21	End of Line 113
13:23	Start of Line 115
13:25	Trouble with Applied Acoustics CSP2, begin troubleshooting
15:18	One harbor seal observed resting on buoy near harbor entrance (Photo 1B), possibly the same one observed during the morning (Photo 1A)
15:20	Return to dock
16:30	Conclude to demobilize

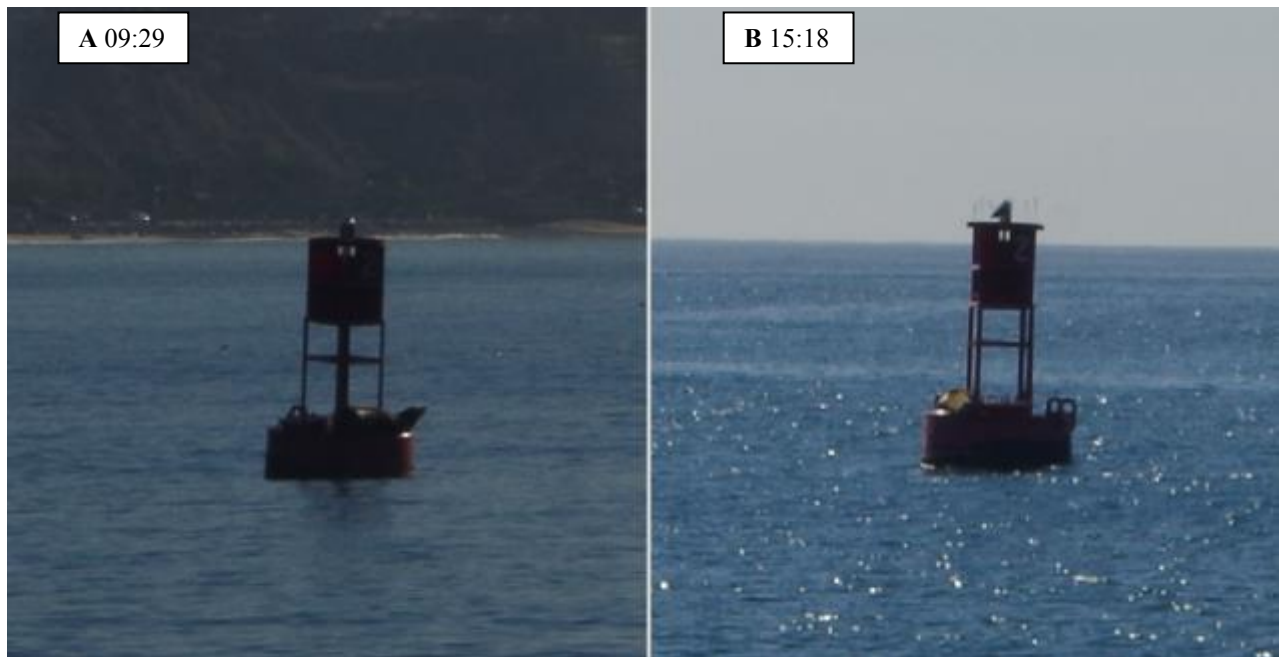


Figure A-1. Marine mammal photo observations

Table A-1. Marine mammal sightings for 14 June 2016.

Sighting No.	Time (PDT)	Bearing	Dist. From Source (m)	Vessel Activity	Species	No. of Animals Observed	Direction of Travel	Behavior
1	09:06	035	30	Pre-watch	Harbor Seal	1	035	Harbor seal ahead of vessel, surfaced then submerged. Photo 1A
2	09:29	-	40	Ramp Up	Harbor Seal	1	Stationary	Harbor seal resting on buoy near harbor entrance
3	11:13	105	50	Acquiring	Harbor Seal	1	?	Sighting not confirmed
4	15:18	-	30	Shutdown	Harbor Seal	1	N	Two harbor seals now resting on buoy near harbor entrance. Photo 1B

APPENDIX B

EXHIBIT H

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
<i>Air Quality and Greenhouse Gas (GHG) Emissions (MND Section 3.3.3)</i>						
MM AIR-1: Engine Tuning, Engine Certification, and Fuels. The following measures will be required to be implemented by all Permittees under the Offshore Geophysical Permit Program (OGPP), as applicable depending on the county offshore which a survey is being conducted. Pursuant to section 93118.5 of CARB's Airborne Toxic Control Measures, the Tier 2 engine requirement applies only to diesel-fueled vessels.	All Counties: Maintain all construction equipment in proper tune according to manufacturers' specifications; fuel all off-road and portable diesel-powered equipment with California Air Resources Board (CARB)-certified motor vehicle diesel fuel limiting sulfur content to 15 parts per million or less (CARB Diesel).	Daily emissions of criteria pollutants during survey activities are minimized.	Determine engine certification of vessel engines. Review engine emissions data to assess compliance, determine if changes in tuning or fuel are required.	OGPP permit holder and contract vessel operator; California State Lands Commission (CSLC) review of Final Monitoring Report.	Prior to, during, and after survey activities. Submit Final Monitoring Report after completion of survey activities.	N/A- exempt-gasoline vessel
	Los Angeles and Orange Counties: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner; the survey shall be operated such that daily NOx emissions do not exceed 100 pounds based on engine certification emission factors. This can be accomplished with Tier 2 engines if daily fuel use is 585 gallons or less, and with Tier 3 engines if daily fuel use is 935 gallons or less		Verify that Tier 2 or cleaner engines are being used. Calculate daily NOx emissions to verify compliance with limitations.			N/A- exempt-gasoline vessel
	San Luis Obispo County: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 585 gallons or less; all diesel equipment shall not idle for more than 5 minutes; engine use needed to maintain position in the water is not considered idling; diesel idling within 300 meters (1,000 feet) of sensitive receptors is not permitted; use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Verify that Tier 2 or cleaner engines are being used. Inform vessel operator(s) of idling limitation. Investigate availability of alternative fuels			N/A- exempt-gasoline vessel
	Santa Barbara County: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 790 gallons or less.		Verify that Tier 2 or cleaner engines are being used. Investigate availability of alternative fuels			N/A- exempt-gasoline vessel
	Ventura County: Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Investigate availability of alternative fuels.			N/A- exempt-gasoline vessel

Geophysical Survey Offshore of Dana Point, California
Field Operations Report

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials
MM BIO-1: Marine Mammal and Sea Turtle Presence – Current Information.	All State waters; prior to commencement of survey operations, the geophysical operator shall: (1) contact the National Oceanic and Atmospheric Administration Long Beach office staff and local whale-watching operations and shall acquire information on the current composition and relative abundance of marine wildlife offshore, and (2) convey sightings data to the vessel operator and crew, survey party chief, and onboard Marine Wildlife Monitors (MWMs) prior to departure. This information will aid the MWMs by providing data on the approximate number and types of organisms that may be in the area.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Document contact with appropriate sources. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; Inquiry to NOAA and local whale watching operators.	Prior to Survey	EC 5/27/16
MM BIO-2: Marine Wildlife Monitors (MWMs).	Except as provided in section 7(h) of the General Permit, a minimum of two (2) qualified MWMs who are experienced in marine wildlife observations shall be onboard the survey vessel throughout both transit and data collection activities. The specific monitoring, observation, and data collection responsibilities shall be identified in the Marine Wildlife Contingency Plan required as part of all Offshore Geophysical Permit Program permits. Qualifications of proposed MWMs shall be submitted to the National Oceanic and Atmospheric Administration (NOAA) and CSLC at least twenty-one (21) days in advance of the survey for their approval by the agencies. Survey operations shall not commence until the CSLC approves the MWMs.	Competent and professional monitoring or marine mammals and sea turtles; compliance with established monitoring policies.	Document contact with and approval by appropriate agencies. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	EC 5/27/16

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials												
MM BIO-3: Safety Zone Monitoring.	Onboard Marine Wildlife Monitors (MWMs) responsible for observations during vessel transit shall be responsible for monitoring during the survey equipment operations. All visual monitoring shall occur from the highest practical vantage point aboard the survey vessel; binoculars shall be used to observe the surrounding area, as appropriate. The MWMs will survey an area (i.e., safety or exclusion zone) based on the equipment used, centered on the sound source (i.e., vessel, towfish), throughout time that the survey equipment is operating. Safety zone radial distances, by equipment type, include:	No adverse effects to marine mammals or sea turtles due to survey activities are observed; compliance with established safety zones.	Compliance with permit requirements (observers); compliance with established safety zones. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	CC 6/14/16												
	<table><tr><th>Equipment Type</th><th>Safety Zone (radius, m)</th></tr><tr><td>Single Beam Echosounder</td><td>50</td></tr><tr><td>Multibeam Echosounder</td><td>500</td></tr><tr><td>Side-Scan Sonar</td><td>600</td></tr><tr><td>Subbottom Profiler</td><td>100</td></tr><tr><td>Boomer System</td><td>100</td></tr></table>						Equipment Type	Safety Zone (radius, m)	Single Beam Echosounder	50	Multibeam Echosounder	500	Side-Scan Sonar	600	Subbottom Profiler	100	Boomer System	100
	Equipment Type						Safety Zone (radius, m)											
	Single Beam Echosounder						50											
	Multibeam Echosounder						500											
	Side-Scan Sonar						600											
	Subbottom Profiler						100											
Boomer System	100																	
If the geophysical survey equipment is operated at or above a frequency of 200 kilohertz (kHz), safety zone monitoring and enforcement is not required; however, if geophysical survey equipment operated at a frequency at or above 200 kHz is used simultaneously with geophysical survey equipment less than 200 kHz, then the safety zone for the equipment less than 200 kHz must be monitored. The onboard MWMs shall have authority to stop operations if a mammal or turtle is observed within the specified safety zone and may be negatively affected by survey activities. The MWMs shall also have authority to recommend continuation (or cessation) of operations during periods of limited visibility (i.e., fog, rain) based on the observed abundance of marine wildlife.																		

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials
MM BIO-3: Safety Zone Monitoring.	Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the onboard MWMs. During operations, if an animal's actions are observed to be irregular, the monitor shall have authority to recommend that equipment be shut down until the animal moves further away from the sound source. If irregular behavior is observed, the equipment shall be shut-off and will be restarted and ramped-up to full power, as applicable, or will not be started until the animal(s) is/are outside of the safety zone or have not been observed for 15 minutes. For nearshore survey operations utilizing vessels that lack the personnel capacity to hold two (2) MWMs aboard during survey operations, at least twenty-one (21) days prior to the commencement of survey activities, the Permittee may petition the CSLC to conduct survey operations with one (1) MWM aboard. The CSLC will consider such authorization on a case-by-case basis and factors the CSLC will consider will include the timing, type, and location of the survey, the size of the vessel, and the availability of alternate vessels for conducting the proposed survey. CSLC authorizations under this subsection will be limited to individual surveys and under any such authorization; the Permittee shall update the MWCP to reflect how survey operations will occur under the authorization.	No adverse effects to marine mammals or sea turtles due to survey activities are observed; compliance with established safety zones.	Compliance with permit requirements (observers); compliance with established safety zones. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	CC 6/14/16

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials
MM BIO-4: Limits on Nighttime OGPP Surveys.	All State waters; nighttime survey operations are prohibited under the OGPP, except as provided below. The CSLC will consider the use of single beam echosounders and passive equipment types at night on a case-by-case basis, taking into consideration the equipment specifications, location, timing, and duration of survey activity.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Presurvey request for nighttime operations, including equipment specifications and proposed use schedule. Document equipment use. Submit Final Monitoring Report after completion of survey activities	OGPP permit holder.	Approval required before survey is initiated. Monitoring Report following completion of survey.	CC 6/14/16
MM BIO-5: Soft Start.	All State waters; the survey operator shall use a “soft start” technique at the beginning of survey activities each day (or following a shut down) to allow any marine mammal that may be in the immediate area to leave before the sound sources reach full energy. Surveys shall not commence at nighttime or when the safety zone cannot be effectively monitored. Operators shall initiate each piece of equipment at the lowest practical sound level, increasing output in such a manner as to increase in steps not exceeding approximately 6 decibels (dB) per 5- minute period. During ramp-up, the Marine Wildlife Monitors (MWMs) shall monitor the safety zone. If marine mammals are sighted within or about to enter the safety zone, a power-down or shut down shall be implemented as though the equipment was operating at full power. Initiation of ramp-up procedures from shut down requires that the MWMs be able to visually observe the full safety zone.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Compliance with permit requirements (observers); compliance with safe start procedures. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Immediately prior to survey.	TN 06/14/16

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials
MM BIO-6: Practical Limitations on Equipment Use and Adherence to Equipment Manufacturer's Routine Maintenance Schedule.	All State waters; geophysical operators shall follow, to the maximum extent possible, the guidelines of Zykov (2013) as they pertain to the use of subbottom profilers and sidescan sonar, including: • Using the highest frequency band possible for the subbottom profiler; • Using the shortest possible pulse length; and • Lowering the pulse rate (pings per second) as much as feasible. Geophysical operators shall consider the potential applicability of these measures to other equipment types (e.g., boomer). Permit holders will conduct routine inspection and maintenance of acoustic-generating equipment to ensure that low energy geophysical equipment used during permitted survey activities remains in proper working order and within manufacturer's equipment specifications. Verification of the date and occurrence of such equipment inspection and maintenance shall be provided in the required presurvey notification to CSLC.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Document initial and during survey equipment settings. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Immediately prior to and during survey.	HW 5/28/16
MM BIO-7: Avoidance of Pinniped Haul-Out Sites.	The Marine Wildlife Contingency Plan (MWCP) developed and implemented for each survey shall include identification of haul-out sites within or immediately adjacent to the proposed survey area. For surveys within 300 meters (m) of a haul-out site, the MWCP shall further require that: • The survey vessel shall not approach within 91 m of a haul-out site, consistent with National Marine Fisheries Service (NMFS) guidelines; • Survey activity close to haul-out sites shall be conducted in an expedited manner to minimize the potential for disturbance of pinnipeds on land; and • Marine Wildlife Monitors shall monitor pinniped activity onshore as the vessel approaches, observing and reporting on the number of pinnipeds potentially disturbed (e.g., via head lifting, flushing into the water). The purpose of such reporting is to provide CSLC and California Department of Fish and Wildlife (CDFW) with information regarding potential	No adverse effects to pinnipeds at haul outs are observed.	Document pinniped reactions to vessel presence and equipment use. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following completion of survey	CC 6/14/16

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Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials
MM BIO-8: Reporting Requirements – Collision.	<p>All State waters; if a collision with marine mammal or reptile occurs, the vessel operator shall document the conditions under which the accident occurred, describing:</p> <ul style="list-style-type: none"> • Vessel location (lat., long.) when collision occurred; • Date and time of collision; • Speed and heading of the vessel at the time of collision; • Observation conditions (e.g., wind speed & direction, swell height, visibility in miles or kilometers, and presence of rain or fog) at time of collision; • Species of marine wildlife contacted (if known); • If an MWM or MMO was onboard; • Vessel name, vessel owner/operator, & captain officer in charge of the vessel at time of collision. After a collision, the vessel shall stop, if safe to do so; however, the vessel is not obligated to stand by and may proceed after confirming that it will not further damage the animal by doing so. The vessel must immediately communicate by radio or telephone all details to the vessel's base of operations, and shall report the incident. Consistent with Marine Mammal Protection Act requirements, the vessel's base of operations or, if an onboard telephone is available, the vessel captain him/herself, will then immediately call the National Oceanic and Atmospheric Administration (NOAA) Stranding Coordinator to report the collision and follow any subsequent instructions. From the report, the Stranding Coordinator will coordinate subsequent action, including enlisting the aid of marine mammal rescue organizations, if appropriate. From the vessel's base of operations, a telephone call will be placed to the Stranding Coordinator, NOAA National Marine Fisheries Service (NMFS), Southwest Region, Long Beach, to obtain instructions. Although NOAA has primary responsibility for marine mammals in both State and Federal waters, the California Department of Fish and Wildlife (CDFW) will also be advised that an incident has occurred in State waters affecting a protected species. 	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following completion of survey.	N/A No Collisions Reported 06/14/16

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Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials
MM BIO-9: Limitations on Survey Operations in Select Marine Protected Areas (MPAs).	All MPAs; prior to commencing survey activities, geophysical operators shall coordinate with the CLSC, California Department of Fish and Wildlife (CDFW), and any other appropriate permitting agency regarding proposed operations within MPAs. The scope and purpose of each survey proposed within a MPA shall be defined by the permit holder, and the applicability of the survey to the allowable MPA activities shall be delineated by the permit holder. If deemed necessary by CDFW, geophysical operators will pursue a scientific collecting permit, or other appropriate authorization, to secure approval to work within a MPA, and shall provide a copy of such authorization to the CSLC as part of the required presurvey notification to CSLC. CSLC, CDFW, and/or other permitting agencies may impose further restrictions on survey activities as conditions of approval	No adverse effects to MPA resources due to survey activities are observed.	Monitor reactions of wildlife to survey operations; report on shutdown conditions and survey restart. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; survey permitted by CDFW.	Prior to survey.	N/A No MPAs in project area
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Permittees shall develop and submit to CSLC staff for review and approval an OSCP that addresses accidental releases of petroleum and/or non-petroleum products during survey operations. Permittees' OSCP's shall include the following information for each vessel to be involved with the survey: <ul style="list-style-type: none"> • Specific steps to be taken in the event of a spill, including notification names, phone numbers, and locations of: (1) nearby emergency medical facilities, and (2) wildlife rescue/response organizations (e.g., Oiled Wildlife Care Network); • Description of crew training and equipment testing procedures; and • Description, quantities, and location of spill response equipment onboard the vessel. 	Reduction in the potential for an accidental spill. Proper and timely response and notification of responsible parties in the event of a spill.	Documentation of proper spill training. Notification of responsible parties in the event of a spill.	OGPP permit holder and contract vessel operator.	Prior to survey.	HE 5/27/16

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Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) & Initials
MM HAZ-2: Vessel fueling restrictions.	Vessel fueling shall only occur at an approved docking facility. No cross vessel fueling shall be allowed.	Reduction in the potential for an accidental spill.	Documentation of fueling activities.	Contract vessel operator.	Following survey.	N/A- boat is trailered and fuels on land
MM HAZ-3: OSCP equipment and supplies.	Onboard spill response equipment and supplies shall be sufficient to contain and recover the worst-case scenario spill of petroleum products as outlined in the OSCP.	Proper and timely response in the event of a spill.	Notification to CSLC of onboard spill response equipment/supplies inventory, verify ability to respond to worst-case spill.	Contract vessel operator.	Prior to survey.	HE 5/27/16- supplies confirmed
MM HAZ-1: (OSCP) Required Information.	Outlined under Hazards and Hazardous Materials (above)					HE 5/27/16
MM HAZ-2: Vessel fueling restrictions.	Outlined under Hazards and Hazardous Materials (above)					N/A- boat is trailered and fuels on land
MM HAZ-3: OSCP equipment and supplies.	Outlined under Hazards and Hazardous Materials (above)					HE 5/27/16
MM BIO-9: Limitations on Survey Operations in Select MPAs.	Outlined under Biological Resources (above)					N/A No MPAs
MM REC-1: U.S. Coast Guard (USCG), Harbormaster, and Dive Shop Operator Notification.	All California waters where recreational diving may occur; as a survey permit condition, the CSLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to divers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least twenty-one (21) days in advance of in-water activities, Permittees shall: (1) post such notices in the harbormasters' offices of regional harbors; and (2) notify operators of dive shops in coastal locations adjacent to the proposed offshore survey operations.	No adverse effects to recreational divers from survey operations.	Notify the USCG, local harbormasters, and local dive shops of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP Permit holder.	Prior to survey.	AJ 5/28/16